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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,129	08/18/2003	Timothy Michael Edmund Frost	MARSP0170US	3518
43076 7590 08/21/2007 MARK D. SARALINO (GENERAL) RENNER, OTTO, BOISSELLE & SKLAR, LLP 1621 EUCLID AVENUE, NINETEENTH FLOOR CLEVELAND, OH 44115-2191			EXAMINER MEW, KEVIN D	
			ART UNIT 2616	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No.		Applicant(s)	
	10/643,129		FROST ET AL.	
	Examiner		Art Unit	
	Kevin Mew		2616	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/17/2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Final Action

Response to Amendment

1. Applicant's Remarks/Arguments filed on 7/17/2007 have been considered. Claims 1-10 are currently pending.
2. Acknowledgement is made of the amended drawings with respect to the objection to the Figs. 1 and 2 set forth in the previous Office action. The corrections are acceptable and the objection to the drawings is now withdrawn.
3. Acknowledgement is made of the amended specification with respect to the objection to the abstract set forth in the previous Office action. The corrections are acceptable and the objection to the specification is now withdrawn.
4. Acknowledgement is made of the amended claims 1, 7-8 with respect to the claim objections set forth in the previous Office action. The corrections are acceptable and the claim objections are now withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-5, 7-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Dudziak et al. (US Publication 2002/0136232 A1).

Regarding claim 1, Dudziak discloses a method of distributing timing information across a packet network (a method of distributing timing information across a Ethernet-based PON system, element 100, Fig. 1), the method comprising:

at a master component (at the central access module 106, comprising optical line terminal OLT 112, paragraph 0024, Fig. 1), generating timing signal packets containing timing signals at predictable intervals using a clock reference of a given frequency (generating telecom clocks based on a reference 8 kHz telecom clock, paragraphs 0032, 0034), and broadcasting or multicasting the timing signal packets to a plurality of client components over (the data transmission clock, which is distributed to the ONUs, paragraph 0035 and Fig. 1) said packet network (over Ethernet-based PON system 100, Fig. 1), preserving the timing signal packet interval (timing information is embedded in the data transmission clock, paragraph 0035); and

at each said client component (optical network unit ONU, paragraph 0024 and element 114, Fig. 1), receiving said timing signal packets (receiving data transmission clock at the ONU, paragraph 0035) and determining the intervals between successive packets (determining two

phase-shifted clocks from the data transmission clock, paragraph 0035), applying a clock recovery algorithm to said determined intervals (using frequency divider on the two phase-shifted clocks) to recover in substantially real time the original clock frequency (to recover a ONU reference clock), and synchronizing the frequency of a local clock of the client component to the recovered frequency (synchronizing the telecom-related clock derived from the ONU reference clock with the telecom-based clock of the OLT, paragraph 0035).

Regarding claim 2, Dudziak discloses a method according to claim 1, the method being used to distribute timing information between various components of a telecommunication system coupled together via a packet network (distributing timing information between OLTs and ONUs via a Ethernet-based PON system, paragraphs 0034, 0035 and Fig. 1).

Regarding claim 3, Dudziak discloses a method according to claim 2, wherein said components include one or more components (ONUs) coupled to TDM networks/links (connected to T1 line via T1 interface, Fig. 5; note that T1 line is TDM digital transmission link).

Regarding claim 4, Dudziak discloses a method according to claim 1, wherein one or more of the components is coupled to a T1 or E1 (T1, paragraph 0034 and Fig. 1), T3 or E3 (T3, paragraph 0035, Fig. 1), SONET or SDH link, performing a data conversion function between the T1 or E1, T3 or E3, SONET or SDH data format and the packet network data format (performing data format conversion from T3 to T1, paragraphs 0034, 0035, Figs. 1 and 5).

Regarding claim 5, Dudziak discloses a method according to claim 1, the packet network providing a backplane of a telecommunications gateway (Ethernet-based PON system is the backplane of a telecom gateway between central office 102 and telephones 104, Fig. 1).

Regarding claim 7, Dudziak discloses an apparatus for enabling the operating clock frequencies of a plurality of components (operating T1 clocks of ONUs, paragraph 0035 and Fig. 1), coupled to a packet network (coupled to Ethernet-based PNO system 100, Fig. 1), to be synchronized to the clock frequency of a master component (synchronized to the T3 clocks of the OLTs 112, paragraphs 0034, 0035 and Fig. 1) also coupled to the packet network (also coupled to Ethernet-based PNO system 100, Fig. 1), the apparatus comprising:

means (OLT 112, Fig. 1) at a master component (at the central access module 106, comprising optical line terminal OLT 112, paragraph 0024, Fig. 1), generating timing signal packets containing timing signals at predictable intervals using a clock reference of a given frequency (generating telecom clocks based on a reference 8 kHz telecom clock, paragraphs 0032, 0034), and broadcasting or multicasting the timing signal packets to a plurality of client components over (the data transmission clock, which is distributed to the ONUs, paragraph 0035 and Fig. 1) said packet network (over Ethernet-based PON system 100, Fig. 1), preserving the timing signal intervals (timing information is embedded in the data transmission clock, paragraph 0035); and

means (Gigabit Ethernet Transceiver 502, Fig. 5) at each said client component (at each optical network unit ONU, paragraph 0024 and element 114, Fig. 1), receiving said timing signal packets (receiving data transmission clock at the ONU, paragraph 0035) and determining the

intervals between successive packets (determining two phase-shifted clocks from the data transmission clock, paragraph 0035), applying a clock recovery algorithm to said determined intervals (using frequency divider on the two phase-shifted clocks) to recover in substantially real time the original clock frequency (to recover a ONU reference clock), and synchronizing the frequency of a local clock of the client component to the recovered frequency (synchronizing the telecom-related clock derived from the ONU reference clock with the telecom-based clock of the OLT, paragraph 0035).

Regarding claim 8, Dudziak discloses a gateway (Ethernet-based PON system 100, Fig. 1) of a telecommunications network, the gateway comprising:

a plurality of components each operating at a local clock frequency (ONUs operating at T1 clock, paragraph 0035, Figs. 1 and 5), one of the components, the master component (central access module 106, paragraph 0024 and Fig. 1), generating or receiving a reference clock signal having a given frequency (receiving a 8KHz telecom-based clock from central office 102, paragraph 0029 and Fig. 1); and

a packet network backplane (combiner/splitter 118, Fig. 1) for communicating packet data between said components (Ethernet-based PON system for communicating data streams between OLTs and ONUs, paragraphs 0034, 0035 and Fig. 1),

the master component having means (at the central access module 106, comprising optical line terminal OLT 112, paragraph 0024, Fig. 1) for generating from said clock reference a stream of timing signal packets containing timing signals at predictable intervals (generating telecom clocks based on a reference 8 kHz telecom clock, paragraphs 0032, 0034), and means

for broadcasting or multicasting said timing signal packets (OLTs for distributing data transmission clock, paragraph 0035), preserving the timing signal packet intervals (timing information is embedded in the data transmission clock, paragraph 0035), to other components (the data transmission clock, which is distributed to the ONUs, paragraph 0035 and Fig. 1) operating at said local clock frequencies (operating at T1 clocks, paragraph 0035 and Fig. 5) via said packet network backplane (via combiner/splitter 118, Fig. 1), and the receiving components (ONUs 114, Fig. 1) having means (synchronizer 510, Fig. 5) for synchronizing their local clock frequencies to said reference clock frequency by analyzing the intervals between received timing signals (for synchronizing the telecom-related clock derived from the ONU reference clock to the telecom-based clock of the OLT by analyzing the two phase-shifted clocks of the received data transmission clock, paragraph 0035).

Regarding claim 9, Dudziak discloses a gateway according to claim 8, wherein at least one of said components is a TDM line card (ONU, element 114, Fig. 5), coupled in use to a TDM link (coupled to T1 line via T1 interface, paragraph 0035 and Fig. 5).

Regarding claim 10, Dudziak discloses a gateway according to claim 9, wherein at least one of the components is be a TDM line card (ONU, element 114, Figs. 1 and 5) coupled to a T1 or E1 link (coupled to T1 line via T1 interface, paragraph 0035 and Fig. 5) whilst at least one other component is a TDM line card (OLT, element 112, Fig. 1) coupled to a T3, E3, SONET or SDH link (coupled to DS3T link 108, Fig. 1), the gateway performing up and down conversions

for data received and sent via the links (the Ethernet-based PON system performs upstream and downstream conversions between T3/DS3 and T1 links, paragraphs 0034, 0035, Figs. 1 and 5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dudziak et al. in view of Chang (US Publication 2003/0020991 A1).

Regarding claim 6, Dudziak discloses all the aspects of claim 1 above. Dudziak also discloses a method according to claim 1, comprising including in said packets (data transmission clock, paragraph 0035).

Dudziak does not explicitly show a priority marker, upon recognition of such packets at routers/switches of the packet network, forwarding them with the highest possible priority.

However, Chang discloses an upstream frame in a PON system, which comprises a priority field (paragraphs 0040, 0041 and Fig. 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of synchronizing between OLTs and ONUs in a Ethernet-based PON system with the teaching of Chang in including a priority field in an upstream frame transmitted in a PON system such that the synchronization method of Dudziak

will show a priority marker, upon recognition of such packets at routers/switches of the packet network, forwarding them with the highest possible priority.

The motivation to do so is to define the priority level of the data packets with respect to data traffic flow such that data packets with highest priority, such as voice data, will be transmitted first than image pictures with a lower priority.

Response to Arguments

7. Applicant's arguments filed on 7/17/2007 have been fully considered but they are not persuasive.

Applicant argued on page 2, paragraph 1 of the Remarks that the Dudziak reference fails to teach or suggest “distributing timing signals by means of timing signal packets,” the examiner respectfully disagrees. It is noted that Dudziak discloses carrying timing information in a variable length packet (paragraph 0009), which is interpreted as the timing packet. The variable length packet also comprises data in addition to the timing information. Therefore, Dudziak teaches ““distributing timing signals by means of timing signal packets.”

In response to applicant's argument on page 2, paragraph 2 of the Remarks that the Dudziak reference fails to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., “means for distributing the timing information provided only at the end nodes of the packet network”) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's argument on page 2, paragraph 2 and page 3, paragraph 1 of the Remarks that the present invention achieves a most significant and substantial advantage, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

In light of the foregoing, claims 1-5, 7-10 stand rejected under 35 U.S.C. 102(e) as being anticipated by Dudziak et al. (US Publication 2002/0136232 A1), and claim 6 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Dudziak et al. in view of Chang (US Publication 2003/0020991 A1).

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


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